

Tricare and Readiness

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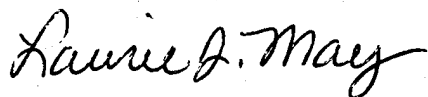
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1. AGENCY USE ONLY (Leave Blank)		2. REPORT DATE January 1996	3. REPORT TYPE AND DATES COVERED Final	
4. TITLE AND SUBTITLE Tricare and Readiness			5. FUNDING NUMBERS C - N00014-91-C-0002 PE - 65154N PR - R0148	
6. AUTHOR(S) Gary E. Horne				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Center for Naval Analyses 4401 Ford Avenue Alexandria, Virginia 22302-0268			8. PERFORMING ORGANIZATION REPORT NUMBER CRM 95-194	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Assistant Chief for Plans, Analysis, and Evaluation, MED-08			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT CLEARED FOR PUBLIC RELEASE			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) This report begins with the authors developing a medical readiness framework as a backdrop for relating Tricare and readiness. The authors then describe results from data available to begin to look at the effect of Tricare on readiness. The quantitative measures available are indirect and show little evidence of changes due to Tricare. Part of the reason for this lack of evidence may be that the implementation of Tricare is not complete or that many of the tensions between readiness and peacetime care transcend the specific system of care. In any event, the authors cannot make conclusions regarding the effect of Tricare on medical readiness at this point in time. They can, however, summarize their framework and insights gained in attempting to link Tricare and readiness, with sights set on the goal of improving readiness in the future and the knowledge that Tricare will be the system in place.				
14. SUBJECT TERMS Health care issues, medical personnel, medical services, military medicine, readiness, training			15. NUMBER OF PAGES 44	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT SAR	

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Summary

We begin this work by developing a medical readiness framework as a backdrop for relating Tricare and readiness. We then describe results from data available to begin to look at the effect of Tricare on readiness. The quantitative measures available are indirect and show little evidence of changes due to Tricare. Part of the reason for this lack of evidence may be that the implementation of Tricare is not complete or that many of the tensions between readiness and peacetime care transcend the specific system of care. In any event, we cannot make conclusions regarding the effect of Tricare on medical readiness at this point in time. We can, however, summarize our framework and insights gained in attempting to link Tricare and readiness, with our sights set on the goal of improving readiness in the future and the knowledge that Tricare will be the system in place.

Here we summarize the major readiness objectives from the following ten perspectives in our medical readiness framework:

- Practitioner
- Field commander
- Leader
- Historian
- Mission planner
- Strategic planner
- Trainer
- Individual services
- Mobilization planner
- Operator.

We then use what we have learned in examining potential measures of readiness to suggest indicators that might be appropriate for measuring performance toward achieving the objectives for each perspective.

The practitioner's health readiness objective is to have service members free of medical problems. Performance indicators in this area include the rate of incidence of medical problems as measured by inpatient and outpatient visit data. Examining wellness measures would also indicate performance on this issue from a different, more positive, angle.

The field commander's health readiness objective is to have deployable personnel. One indicator would be data on compliance for all things required by regulations to deploy (immunizations, physical screenings, etc.). Another indicator, this one negative, would be a count of service members sent home from deployments for medical reasons.

The leader's health readiness objective is to keep the military workforce on the job. A general indicator would be the number of personnel out or on limited duty for medical reasons. Specific indicators include the length of waits for needed procedures, such as orthopedic treatment.

The historian's objective is to learn from history. This translates into care readiness objectives if we look at some of the specifics, such as the prevalence of DNBI and the associated objective of providing the best possible preventive medicine. Indicators in this case would include measures of preventive medical capability, such as water purification capability.

The mission planner's care readiness objective is to be ready to provide the kind of care needed depending on the particular mission at hand. Because every scenario is different, this objective is difficult to identify: it is impossible to be ready for anything, anywhere, anytime. But we can use case mix and patient mix to indicate what medical personnel are practicing, relate that to the type and place of missions anticipated, and as a result know what additional experience might still be useful in various situations.

The strategic planner's care readiness objective is make improvements within each of the functional areas supporting care. The *Medical Readiness Strategic Plan 2001* [1] contains action plans supporting nine functional areas. The data required to indicate performance vary according to the area. Here we just mention an example in one of the nine areas, evacuation. A performance indicator in the functional area of evacuation would be the time for evacuation from injury to definitive care averaged from data collected during military exercises or operations [2].

The trainer's care readiness objective is to provide the appropriate training to all medical personnel. This means providing the right amount and the right kind of training. The amount of time spent on readiness training is a starting point and certainly a useful overall indicator for this objective. But to measure progress toward this objective properly, a detailed look at what kind of training medical personnel need at all levels is required to accompany information on the number of people getting the training and the time they spend.

The care readiness objective of the individual services is to ensure preparedness for those aspects of readiness that are unique to each service. The first step toward measuring progress toward this objective would be to carefully outline these aspects for all services. The next step would be to determine for each aspect what readiness measures from the other perspectives might apply.

The mobilization planner's care readiness objective is to ensure that personnel and equipment are available to provide proper care at the contingency site as well as back home. Thus, indicators of readiness fall into the two areas of call-up and backfill and involve measures of both active-duty and reserve personnel. The most realistic indicators are measures of the manning and equipping of units as well as the backfill at military treatment facilities (MTFs) during actual operations. But realistic call-ups and backfill can also be exercised before major medical exercise play.

The operator's care readiness objective is to provide care quickly and of sufficient quality to save lives while allowing the fighting forces to focus on their job [3]. This may mean bringing the proper care to casualties or taking the casualties to the proper echelon of care. In

any case, the operator wants victory in battle at the least possible cost in casualties. In an actual operation, or even an exercise, victory and number/severity of casualties are easily measured and indicate performance toward the operator's objective. Unfortunately, assumptions and extrapolations must be made to determine if changing some variable (e.g., the number of corpsmen with each unit) would change the number of casualties without changing the outcome of battle.

Introduction

The military is moving toward managed care options in reforming the military health care system. In particular, the Tricare demonstration project in the Tidewater area of Virginia makes changes in the delivery of health care to military beneficiaries in the area. Also, military leaders emphasize that maintaining readiness is the number one goal of the military medical community. In this research memorandum, we discuss the effect of Tricare on medical readiness.

History of the Tricare program

In October 1992, the Tidewater area of Virginia was designated as a demonstration site for Tricare. This area includes beneficiaries currently served by Naval Hospital, Portsmouth; McDonald Army Hospital, Ft. Eustis; and 1st Medical Group (TAC), Langley Air Force Base. Tricare is a triservice managed-care initiative, designed to enhance military beneficiaries' access to care, improve mechanisms for quality assurance, control rising costs, and increase coordination between the military and civilian components of the military health care system. To achieve the program's objectives, and ensure the most efficient use of military treatment facilities, the plan offers non-active-duty beneficiaries three health care options:

- Tricare Standard—the standard CHAMPUS¹ benefits plan.
- Tricare Extra—a network of preferred providers. On a case-by-case basis, beneficiaries can choose to use the preferred providers' network and reduce their level of cost sharing.
- Tricare Prime—a managed-care option centered on the MTF and supplemented by a network of civilian providers. Enrolled beneficiaries will be guaranteed access and will receive

1. Civilian Health and Medical Program of the Uniformed Services.

increased coverage. Except for emergency care, enrollees must obtain all primary care from either their primary care manager or another provider to whom the member is referred.

Active-duty service members themselves do not sign up for one of the three options above. But the system as a whole has changed; active-duty personnel are assigned to a primary care manager just as enrolled family members are, with the site based on their duty station. They are the first priority for care in military hospitals and clinics, with routine care provided by their primary care manager. With Tricare, the local Hospital Commanders have the authority and resources to manage both military and civilian health care for active-duty members, military families, and retirees. Thus, when we refer to Tricare in this paper, we are considering the whole military health care program in the Tidewater area serving all beneficiaries—active-duty and non-active-duty members.

Why might Tricare affect medical readiness? The emphasis under Tricare on primary care medicine, prevention, and utilization management may affect medical readiness by altering the method of delivery and mix of care provided. Changes of this nature could affect the health of the force as well as the readiness of medical personnel to provide care during military contingencies.

The Tricare program in Tidewater is still in its infancy. It has been implemented in stages, with the HMO component just now coming on line. Therefore, we can expect the program to have at most a minimal effect on readiness.

Given this situation, this paper is not meant to be a definitive analysis of changes in readiness indicators attributable to the Tricare program. Rather, we offer a framework for viewing medical readiness, suggest several measures for quantifying it, and present a methodology for evaluating changes in these readiness indicators.

Measuring medical readiness

It is difficult to measure medical readiness directly. Other than performance data from exercises, few direct measures of readiness exist. Consequently, military analysts measure readiness in terms of

manning levels, the completion of training, and the operational condition of equipment. Although these factors will affect the mission performance of the forces, they are at best only indirect measures of readiness.

The problem with measuring readiness indirectly is that the indirect measures can change without having a significant effect on readiness. For example, we believe that, as training levels change, readiness changes. Clearly, this is the case as one moves from no training to some training. But we expect that at some point there are diminishing returns to additional training. Small changes in training, such as increasing the quantity of training by one course, or one exercise, may have no measurable impact on readiness. Thus, we could observe a change in training levels without necessarily having a significant change in readiness.

Because we lack continuous direct measures of medical readiness, we will use indirect measures to gauge the effect of Tricare on readiness.

The two sides of medical readiness

In studying the effect of the Tricare program on medical readiness, we need to have a full understanding of medical readiness. What is medical readiness? A logical place to start in answering this question is the official definition approved by DoD in 1993:

Medical Readiness encompasses the ability to mobilize, deploy and sustain field medical services and support for any operation requiring military services; to maintain and project the continuum of healthcare resources required to provide for the health of the force; and to operate in conjunction with beneficiary healthcare.

But medical readiness means different things to different people, and the definition above is general enough to allow room for a great deal of interpretation. During this study, we found that how the definition above translates into details differs greatly depending on the perspective of the person describing the details. In other words, there were as many specific definitions of medical readiness as there were people with whom we spoke.

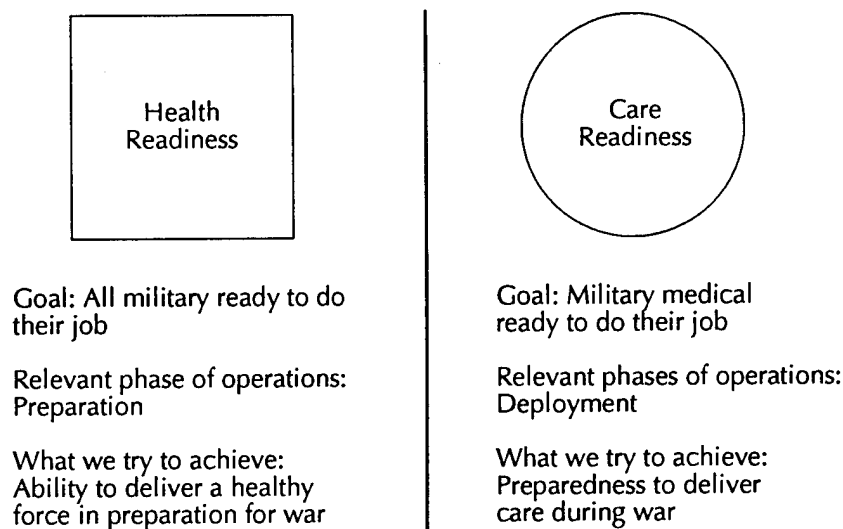
To analyze the effect of Tricare on medical readiness, we need to understand the details of medical readiness. Thus, we begin to build a framework for medical readiness that is compatible with the official definition but still captures the richness and complexity of medical readiness.

We began to develop this framework by getting as many perspectives of medical readiness as possible. The first pattern we noticed when discussing the topic with those within the military medical community. For the most part, people talked strictly about one of two basic sides of medical readiness. One side was oriented toward the health of the individual; the other, toward those providing the care. We call the first orientation health readiness and the second care readiness.

In relating these two orientations to the phases of overall military operations, our framework includes the understanding that health readiness is part of the preparation phase because the health of all personnel is part of preparing for future military operations. Correspondingly, the deployment of medical personnel and equipment is part of the overall deployment process, and medical support is provided during the overall execution of operations. Thus, care readiness is part of overall readiness for the deployment and execution phases of military operations.

Health readiness involves maintaining the health of all types of military personnel. Relevant measures of effectiveness must in some way quantify the ability to deliver a healthy force, a fighting force prepared for war. (Note that we are talking about the health of service members only—not of dependents or retirees.) Care readiness involves the readiness of the caregivers themselves as well as all medical support personnel and equipment involved in providing care during military operations. Relevant measures of effectiveness must in some way quantify the ability to deliver supportive care during military operations—a medical force prepared for war. Figure 1 summarizes the two sides of medical readiness.

Figure 1. The two sides of medical readiness



A medical readiness framework

In this section, we present our framework for medical readiness. It is “our” framework only in the sense that we put it together. In reality, it represents the thinking of many experts throughout the military community. It is a perspectives-based framework, getting at the details of medical readiness through the eyes of many informed people, each having different vantage points from which to view medical readiness. This framework starts with the two orientations, health readiness and care readiness.

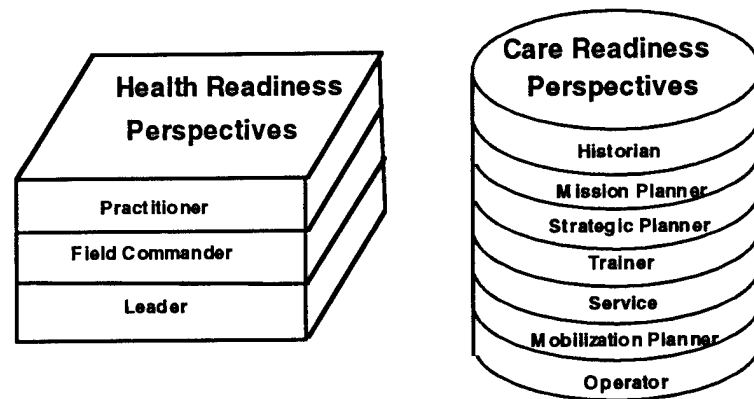
Health readiness can be viewed at least three different ways. We name these perspectives according to the primary group of people from which each perspective came. These perspectives come from people we label as practitioners, field commanders, and leaders.

In the same manner, care readiness can be viewed at least seven different ways. Here the perspectives come from people we label as historians, mission planners, strategic planners, trainers, the individual services, mobilization planners, and operators. We should note that many people with whom we spoke had a vast amount of experience and provided information from multiple perspectives. There was a great deal of overlap in the information we obtained. This framework is our effort to sort out this information to have a basis on which to analyze the impact of Tricare on readiness and to begin to understand how readiness might improve under Tricare. Figure 2 lists the different perspectives.

As discussed, health readiness and care readiness are clearly distinct. Within each, however, there are many threads that run through multiple perspectives. For example, the topic of trauma surgeons ran through many perspectives on the care readiness side. Trainers were concerned about the lack of opportunities within the military health care system to perform trauma surgery in preparation for war, operators were interested in the numbers and capabilities of trauma

surgeons at each echelon of care, and mobilizers wanted to identify both reserve and active-duty physicians with recent experience in trauma surgery. In the following subsections, we give specifics on each of the perspectives we identified, first on the health readiness side and then under the care readiness side.

Figure 2. Medical readiness perspectives



In the short run, these details will simply give rise to more questions concerning readiness. And they won't necessarily have immediate answers. In the long run, however, these specifics should help in choosing and developing readiness-related measures that allow for more information on readiness. Also in the long run, a full definition or framework for readiness is important because it helps us to better identify the issues we need to address and allows us to focus attention on specific areas that need attention.

Health readiness

Practitioner perspective

We first take a look at readiness from the point of view of the military personnel who practice medicine. Their view is very focused on the patient. We emphasize here that when we talk about health readiness we are talking about patients who are on active duty or in the reserves, not dependents or retirees. Readiness from the practitioner's point of view means service members who are free of medical problems. At the individual level, the service member is not ready if he or she is in an inpatient status or assigned to quarters because of a particular diagnosis. The practitioner's goal then is to treat the service member until he or she is healthy, that is, until the service member has overcome the diagnosed condition.

Field commander perspective

The field commander is interested in the bottom line: Is a service member deployable? The task of these commanders is to be ready to fight when called. They need a fighting force, so they consider a person ready if he or she can go to war. Thus, readiness from this perspective includes compliance for immunizations, physical screenings, and so on, for which noncompliance means nondeployability.

Leader perspective

Many military leaders in high positions have the experience and long-term outlook to take a big-picture view of readiness. In different ways they ask, How can the military workforce as a whole be kept on the job? They know that at any given time a certain number of service members will not be on the job for various health-related reasons. They want to know what will minimize this number over time. They have the viewpoint that preparation for war is an *ongoing* dynamic process, that *people* are the key to the process, and that *every* service member is an important person in the process. To give some specifics, people with this perspective on readiness feel that it is important to minimize medical appointment scheduling difficulties and waits for needed procedures for all service members. More generally, those

with this big-picture viewpoint believe that wellness over the long term is the key to health readiness.

Care readiness

Historian perspective

Many people are very familiar with medical support in past military operations. They look to the past to gain lessons for the future regarding readiness to provide care. We call them historians. They are concerned with being prepared to provide a variety of care. They consistently cite the need to be ready to provide care for disease and non-battle-injury (DNBI) cases in addition to those who are wounded in action (WIA). Historians also look at past wars and warn that our medical support system must anticipate the possibility of caring not only for our own troops, but for enemy troops and civilians as well. In the case of WIA, historians note that the kind of care needed has varied tremendously depending on the weapons available to the enemy. In the case of DNBI, history provides examples of differing medical care support needs depending on the location of the fighting (e.g., the need to treat tropical diseases in Vietnam).

Mission planner perspective

Mission planners want to be ready to provide the kind of care needed depending on the mission to be accomplished. To name a few, the overall mission objective might be to regain territory, deter aggression, provide humanitarian assistance, or provide local disaster relief. They must plan against the capabilities of the adversary and the details of each situation. Though they know the basic objective at hand, their planning must remain flexible as events unfold. In addition, mission planners must balance their desire to provide the best possible medical care with the overall needs presented by a particular scenario. More often than not, the situation for which they must plan has a great deal of associated uncertainty. The overall direction (and, thus, the medical requirements) might change at a moment's notice. The example that mission planners often cite is the rapid shift in anticipated medical needs as we went from Desert Shield to Desert Storm.

Strategic planner perspective

Strategic planners ask, What functional areas support providing care? They are then interested in ways to improve readiness within each of these functional areas. The *Medical Readiness Strategic Plan 2001*, or *MRSP*, is a comprehensive plan published in March 1995 [1]. It provides details concerning 9 functional areas:

- Planning
- Requirements, capabilities, and assessment
- Command, control, communications, computers, and information management (C4I)
- Logistics
- Medical evacuation
- Manpower and personnel
- Training
- Blood
- Readiness oversight.

The *MRSP* also contains 42 action plans for achieving readiness objectives in the 9 areas. The large number of objectives outlined intertwine throughout the care readiness side of our perspective-based framework. Some, such as the training function, match cleanly with the trainer perspective described in the next subsection. Other functional areas are important to multiple perspectives. For example, the C4I area is one mentioned often by mission planners, mobilizers, operators, and others.

Trainer perspective

People in the training community stressed the importance of realistic military training. The individual competence of persons to perform medical-related duties in peacetime is not in question. However, serious shortfalls exist because of the lack of training opportunities in two general categories. The first is preparing people to perform specific tasks during military operations. The example cited often is the need

for trauma surgery experience. The second category is preparing organizational teams to accomplish required military tasks as a group, such as treating mass casualties in a wartime environment. Trainers stressed the importance of joint training because of the manner in which our military expects to fight in the future. Trainers were also quick to point out the following situation, which highlights the tension that arises between peacetime health care and the need for wartime training. Sending a physician off to a training experience is done reluctantly or not at all because it means absence from the job at a military treatment facility.

Service perspective

Certain aspects of care readiness are unique to, or at least apply most heavily to, one particular service (e.g., medical care provided to service members during operational at-sea deployments). Those involved are predominantly Navy and Marine Corps personnel and this fact may influence the service perspective on various care readiness factors. Also, specific areas of medical practice may be important to wartime requirements of a particular service. One example is the need to be ready to care for illnesses and injuries associated with undersea activity performed by Navy Seals.

Mobilization planner perspective

People responsible for mobilization of medical support need to know what is required to put care into place. Mobilization includes both the deployment of medical personnel and equipment to the contingency area and the backfill required to continue to provide care at home. Mobilization planners are concerned with reserves and associated readiness issues because of the importance of reserves to the military medical community. They cite medical support during Operation Desert Shield/Storm as an example of reserves playing a key role in deploying as well as backfilling for active-duty service members who deployed.

Operator perspective

Operators want the best possible medical care for combat casualties. Providing this care includes moving the patients to higher echelons

of care during military operations and providing the best *possible* care at each echelon. They know that what is possible on the field of battle is far from perfect. The operator must balance the desire to provide timely evacuation and medical care for individual combat casualties with the overall needs of the force during battle. For instance, at a given time it may endanger even more lives to get an injured person to care. In another situation, the sheer numbers of casualties at a certain place and time may make allocation of scarce medical resources difficult.

Framework summary

We summarize our framework by revisiting the official definition of medical readiness. Here we break it into its three parts. Medical readiness encompasses the ability to:

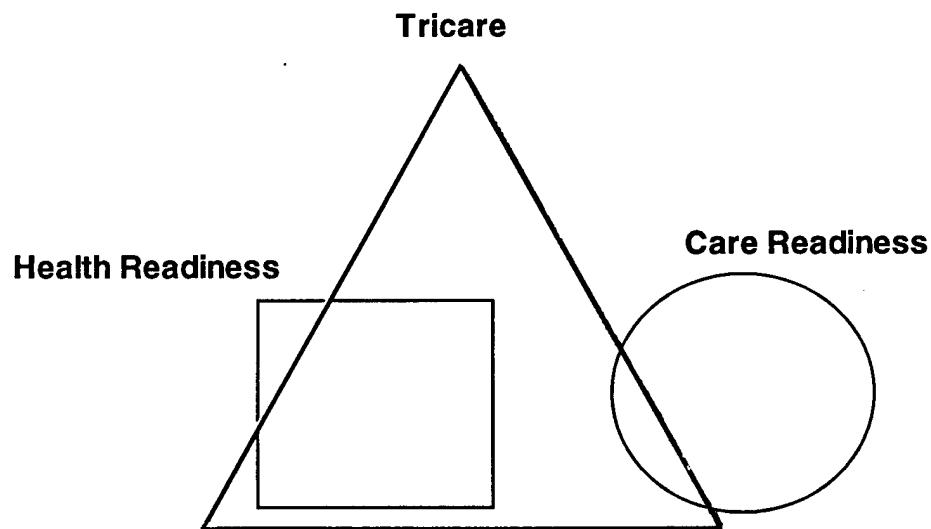
1. Mobilize, deploy, and sustain field medical services and support for any operation requiring military services
2. Maintain and project the continuum of health care resources required to provide for the health of the force
3. Operate in conjunction with beneficiary health care.

Part 1 is what we have called care readiness in our framework and part 2 is what we have called health readiness. The remainder of this paper will tackle the relationship suggested by part 3. Part 3 suggests that beneficiary health care, or peacetime health care (specifically, the Tricare demonstration in the Tidewater area in this study), and medical readiness coexist in some fashion. In fact, their coexistence is complex because of how they are interrelated. It appears that there is often great tension between the two. On the other hand, sometimes there may be opportunities for synergy between the two, or at least situations where they are not in competition.

Where does Tricare fit in the readiness picture?

To better understand how Tricare is related to readiness, we use our framework and consider health readiness and care readiness separately. We illustrate with figure 3. The areas of the three geometric figures notionally represent the resource outlay associated with Tricare, health readiness, and care readiness. Here we are describing what our analysis showed concerning Tricare fitting into the readiness picture. This discussion centers on the relationships, not specific amounts of resources, so the areas of the three geometric figures are not necessarily drawn to scale.

Figure 3. Tricare and readiness intersection



The intersection of Tricare and health readiness is that part of Tricare that provides active-duty personnel formal health care. The portion of the health readiness square that falls outside the Tricare triangle represents efforts by active-duty service members to maintain their health outside the Tricare program. The intersection of the Tricare triangle and the care readiness circle represents that portion of Tricare that provides the military medical establishment with resources or experience that is useful in preparing to provide care during military operations. The portion of the circle outside the triangle represents the additional time and money that must be spent to maintain readiness during peacetime.

The information from many perspectives indicates that Tricare, as the new program of peacetime health care, may have a positive effect on medical readiness, especially health readiness where improvements in the system may mean healthier service members at no increase in overall costs.

In general, the major pull between Tricare and readiness was indicated to us as being with the care readiness side. This opposition can be described by referring to figure 3. The total resource outlay by the military in the overall medical category is the area covered by the union of the triangle and the circle. If the total resource outlay remains the same, then an increase in one will result in a decrease in the other. Herein lies the fundamental tension between the two.

The tensions between medical readiness and peacetime health care certainly existed before Tricare, and they may or may not change under Tricare. We now take a closer look at how Tricare and readiness may be related based on available data.

Measuring Tricare/readiness links

The implementation of Tricare leads us to ask many questions under the rubric of linking Tricare to medical readiness. How can we deal with the tensions described in the previous section? Does the new system allow for avenues to improve readiness? What are some of these avenues? There may be possibilities that have always existed or new ideas that are now possible because of the shift to the new system. To build on those aspects of Tricare that will allow for improved readiness, we can begin by identifying characteristics that are important to readiness and measuring them in some way.

A before-and-after look at some quantifiable measures that may be related to both Tricare and readiness will begin to inform this building process. This look, of course, may also indicate possible effects of Tricare on readiness during its initial implementation period as envisioned at the start of the Tricare study in general and as outlined in planning for the readiness portion of the study [4].

The following subsections describe the results of our examination of some measures available at the start and two years after the initial implementation of Tricare in the Tidewater area. In examining changes during this time period, we wanted to distinguish any changes that might be attributable to the Tricare program from changes attributable to other events. To accomplish this, we collected data from the Tricare demonstration area as well as control sites in 1992, before the start of Tricare, and 2 years later. Data were not always in a standard format or centrally reported. This part of the research memorandum will present the results that the available data permitted.

As mentioned earlier, the three Tidewater area MTFs are at Portsmouth, Ft. Eustis, and Langley Air Force Base. We chose two sets of comparison sites for our analysis. In North Carolina, two catchment areas, Cherry Point and Camp Lejeune, were chosen because they provide health care through a combination of MTFs and CHAMPUS.

This is the same health care delivery system used in the Tidewater region before the implementation of Tricare. We chose four southern California catchment areas as comparison sites: San Diego, March Air Force Base, Ft. Irwin, and Camp Pendleton. In this region, military health care is provided through a preexisting DOD demonstration project using a managed care approach, the CHAMPUS Reform Initiative.

We will describe results from the data available at the nine sites described above and supplement this information with qualitative information we collected from interviews with military clinicians and other personnel. The quantitative measures available are indirect and the implementation of Tricare is not complete; thus, we realize at the outset that strong conclusions regarding the effect of Tricare on readiness are not possible at this point in time. But in addition to examining changes in the measures, we will note ideas brought forth and insights gained toward the eventual goal of improving readiness in the future under Tricare.

The general approach we take in our analysis is to group the data from individual catchment areas into three regions, as follows:

Region	Abbreviation	Catchment areas
Tidewater Virginia	VA	Portsmouth Eustis Langley AFB
Southern California	CA	San Diego March AFB Camp Pendleton Fort Irwin
North Carolina	NC	Cherry Point Camp Lejeune

We compared readiness statistics from the Tidewater demonstration area with those measured in the southern California and North Carolina regions. We measured a "Tricare effect" as the change in a control group (southern California or North Carolina), minus the changes shown in the Tidewater statistics. The Tricare effect, measured relative to North Carolina, indicates changes in readiness

relative to those in a region where no managed military health care is practiced. The Tricare effect, measured relative to southern California, indicates changes in readiness relative to those in a region where a more mature managed military health care system is in operation.

If we were to observe a change in a particular readiness statistic over time, how large must this change be for us to conclude that Tricare has "significantly" affected readiness? The answer to this question depends on how far removed that measure is from the underlying readiness component. For example, suppose the readiness component of interest is the deployability of a unit, and suppose this depended on its members having some inoculations. If the unit were not able to deploy unless some minimum percentage of the crew were inoculated, then a significant change in that readiness indicator would be one that puts it above or below the minimum percentage. For less direct measures of readiness, what constitutes a significant change is more difficult to specify. Here, expert judgments of military commanders should be used to establish criteria.

Health readiness

How might Tricare be linked to health readiness? We explored the following measures that may be related to both Tricare and health readiness.

- Incidence/use
- Amount of well care received
- Amount of supplementary care.

In addition, we discussed the effect of Tricare on support of the operational forces with the fleet, including line officers, enlisted, and medical personnel.

Incidence/use

The greater emphasis on well care under Tricare may reduce the rate of incidence of medical problems. Of course, active-duty personnel have always been given priority in the military medical system, and this will continue under Tricare. We explored this issue by examining

the number of inpatient admissions and sick care outpatient visits for active-duty personnel. A positive impact of Tricare on health readiness should be reflected by a decrease in these measures over time. In our analysis, we assume that active-duty personnel are receiving the care they require. Therefore, a decrease in the number of visits and admissions, for a given force size, would indicate a "healthier" force.

Using Biometrics data, we looked at inpatient admissions for active-duty personnel in FY 1992 and FY 1994. Table 1 contains this information for the sites for which we have data. The "change" column is the percentage increase or decrease in 1994, over the 1992 base year. The "net effect" is calculated as the change in the region/control group that appears in the first column of the table, minus the change in Tidewater (VA). Although the number of admissions is higher for all regions, the differences are small. The results show that admissions increased in each region. Active-duty admissions did not increase as much as in California (a net "improvement" of 1.7 percent), but they did increase 0.8 percent, relative to North Carolina.

Table 1. Active-duty inpatient admissions per 100,000 of population by region for FY 1992 and FY 1994

Region	FY 1992	FY 1994	Percentage	
			Change	Net effect
VA ^a	10,050	10,328	2.8	
CA ^b	9,351	9,771	4.5	1.7
NC ^c	8,974	9,152	2.0	-0.8

a. Portsmouth

b. Pendleton, San Diego

c. Lejeune, Cherry Point

Using Worldwide Outpatient Reporting System (WORS) data, we compared active-duty outpatient visits to the MTFs at Navy sites for FY 1992 with FY 1994. The number increased substantially for the Tricare site, Portsmouth, relative to the other sites. Further investigation of these results revealed different practices in data collection at Portsmouth during FY 1992 and FY 1994. Therefore, we do not consider the currently available data reliable for drawing any conclusions. In addition, from WORS one cannot separate well care from sick care. To measure the impact of Tricare on the incidence of sick care, we

need to be able to identify the type of outpatient visit. In the future, the Ambulatory Data System (ADS) and CHCS will allow one to identify the type of outpatient visit.

Well care

The increased emphasis on preventive medicine under Tricare may be a factor in changes in the amount of well care provided. We collected well care information from active-duty service members in both 1992 and 1994 via our survey. Estimates from survey data contain sampling errors and are prone to other errors associated with people recalling past events. Therefore, larger changes in the measures derived from these data are needed to indicate a "significant" effect.

We looked at survey results for active-duty members for information on time since last physical exam, last blood pressure check, and last rectal exam. For female active-duty service members, we also looked at information on time since last Pap smear, last breast exam, and last mammogram. The results appear in tables 2 and 3. In general, we observed small decreases in levels of well care from 1992 to 1994. The largest changes observed were for female active-duty personnel (i.e., Pap smear, breast exam, and mammogram). However, because of the greater degree of imprecision for these estimates due to small sample sizes, the net effects are not large enough to be significant.

Supplementary care

Tricare could affect the readiness of operational forces if there were an increase in the role of civilians in providing medical care to active-duty personnel. This increase could occur if the Tricare program directly increases the role of civilians in providing active-duty care or if active-duty personnel seek care outside the military system. The concern is that military personnel might not get the "right" care by civilian doctors. For example, physical exams of aviators might not be as thorough as those provided by military flight surgeons. We explored the role of civilians providing care to active-duty personnel using information from our 1992 and 1994 surveys. The surveys showed the percentage of active duty covered by civilian health insurance to be very low across years and across sites (see table 4).

Table 2. Percentages of active-duty members replying "within the last 12 months" for three procedures

Region ^a	1992	1994	Change	Net effect
Last physical exam				
VA	46.6	45.4	-1.2	
CA	46.6	47.0	0.4	-1.7
NC	45.3	47.8	2.5	-3.7
Last blood pressure check				
VA	90.4	87.8	-2.6	
CA	92.8	87.0	-5.8	3.2
NC	91.2	87.9	-3.3	0.7
Last rectal exam				
VA	30.4	28.8	-1.6	
CA	29.4	27.7	-1.7	0.1
NC	24.0	23.4	-0.6	-1.0

a. Regions include all catchment areas.

Table 3. Percentages of female active-duty members replying "within the last 12 months" for three procedures

Region ^a	1992	1994	Change	Net effect
Last Pap smear				
VA	84.1	77.0	-7.1	
CA	85.4	81.5	-3.8	-3.3
NC	84.4	76.6	-7.9	0.7
Last breast exam				
VA	81.9	73.3	-8.6	
CA	82.4	77.3	-5.1	-3.5
NC	80.2	73.8	-6.5	-2.2
Last mammogram				
VA	11.1	10.7	-0.4	
CA	11.8	4.5	-7.3	6.9
NC	13.1	7.3	-5.8	5.4

a. Regions include all catchment areas.

Table 4. Percentage of active duty covered by civilian health insurance

Region ^a	1992	1994	Change	Net effect
VA	1.9	2.6	0.7	
CA	3.4	2.7	-0.7	1.4
NC	3.4	2.0	-1.3	2.0

a. Regions include all catchment areas.

Fleet perspective

We supplemented the quantitative data related to health readiness described above with information collected through discussions with active-duty members in the fleet, including line officers, enlisted, and medical personnel. In these discussions, we could be direct in our approach, as opposed to the indirect measures summarized above. In structured interviews, we began by describing our readiness framework and then sought to understand how Tricare may be linked to readiness from each person's perspective.

Many people interviewed were not aware of all of the changes to the health care system that are in progress. The fact that Tricare is new and that full implementation has not been achieved appeared to underlie this fact. Also, the fact that active duty had always had priority in the system meant that active-duty members may not have noticed great changes in their own personal health care.

Health readiness was important to commanders in the fleet because of the numerous problems that arise when active duty service members are deployed in a substandard state of health readiness. Medical personnel in the fleet felt that the emphasis on well care will eventually have a positive effect on health readiness, but that we won't see these effects for many years—certainly not in a 2-year time frame. We were told that we should expect to see results if we looked at a 15-year time frame.

Care readiness

We now look at possible links between Tricare and care readiness. Many people with experience in operational medicine felt that realistic training opportunities were few and far between. Many cited examples from Desert Storm as evidence that medical personnel often have difficulties when moved from a peacetime care environment to a wartime situation. These observations were not particularly related to Tricare. Many said that training opportunities would continue to be few and far between under any system. For example, the shift to Tricare does not directly provide additional opportunities to treat trauma patients any more than the old system. Also, mobilization

planners did not expect Tricare to have any direct effect on mobilization plans.

We attempted to get some insight into possible links between Tricare and care readiness using quantitative data by exploring the following measures that may be related to both:

- Patient mix
- Case mix
- Training time.

Patient mix

In wartime, medical personnel will be providing care to active-duty personnel. The mix of patients at MTFs, of course, includes dependents, retirees, and others. Here we assume that the richness and complexity of the workload should increase readiness. Because retirees are likely to be less healthy on average, an increase in workload attributable to these patients should increase readiness of military doctors.

We used Biometrics data to look at the number of inpatient admissions in these categories at the MTFs for which data were available for the last 6 months of both FY 1992 and FY 1994. The numbers in each category (see table 5) showed little change from 1992 to 1994 and certainly no changes that can be attributed to Tricare.

Table 5. Change in percentage of inpatient admissions who are retired from active duty

Region ^a	Retired/total		Percentage	
	1992	1994	Change	Net effect
VA	11.9	10.6	-1.3	
CA	12.9	11.9	-1.0	-0.3
NC	3.9	4.9	1.0	-2.3

a. Regions include all catchment areas.

Case mix

Because there are several ways in which Tricare may affect case mix, it is difficult to predict the net impact. Tricare may directly affect case mix in two opposing ways. The greater emphasis on primary care medicine may increase the primary care workload at the MTFs. In contrast, the emphasis on using the MTFs as referral centers may increase the specialty care workload at the MTF. Indirectly, the case mix at the MTFs may change if there is a significant change in the patient mix. The mix of patients, and potentially the case mix seen at the MTFs, may be affected by who joins Tricare Prime.

The readiness of medical personnel may be affected if there is a significant change in the case mix at the MTFs. The wartime caseload, with the high numbers of surgery, trauma, and burn cases, is very different from the peacetime caseload. Many have suggested that, to keep wartime critical skills sharp, medical personnel must see a sufficient number of these specific types of cases. Others have suggested that there may be a large amount of "crossover" sharpening. By this they mean that performing certain surgical procedures on a peacetime patient (for example, on a cancer patient) may help keep skills sharp for wartime injuries.

How much each procedure helps in sharpening wartime skills is an extremely difficult question to answer. Thus, the first look at case mix we will present here is an overall look at the total number of surgical procedures at the MTFs for which we had Biometrics data for the last 6 months of FY 1992 and FY 1994. While the surgical workload per surgeon was highest at the Tricare MTFs, the number of procedures per surgeon decreased in all regions. However, the decrease at Tricare sites was smaller than elsewhere. The net effect was an increase in surgical workload for Tricare doctors, relative to the surgical workload elsewhere. (See table 6.)

We now illustrate how data on specific diagnoses might be used to indicate readiness. The key is to identify those diagnoses treated in peacetime that apply to wartime. As stated above, perhaps all treatment relates in some way to readiness for wartime. Here we will look at some direct connections between peacetime practice and needed wartime skills.

Table 6. Number of surgical procedures (per staff MTF surgeon) performed during last 6 months of FY 1992 and FY 1994

Region ^a	1992	1994	Percentage	
			Change	Net effect
VA	401	371	-7.7	
CA	397	295	-25.8	18.1
NC	312	276	-11.6	3.9

a. Regions include all catchment areas.

For our illustration, we used information provided by the Naval Health Research Center, or NHRC [5, 6, and 7]. Where possible, researchers at NHRC matched patient condition codes to hospitalizations of active-duty Marines in Vietnam between July 1965 and June 1971. NHRC also developed a conversion of ICD-9 diagnosis codes to these patient conditions. This conversion and the ICD-9 diagnosis data contained within our Biometrics data allow us to look at any patient condition and find out how many patients were diagnosed with a corresponding ICD-9 diagnosis during peacetime operations at the MTFs in this study.

We chose to look at the five most frequently occurring battle injuries among the patient conditions recorded in the Vietnam database by NHRC (see table 7). The five battle injuries account for 64 percent of battle injury hospitalizations in the Vietnam database. We then used the NHRC conversion information to get the ICD-9 diagnosis codes for these patient conditions. Finally, we computed the frequency of these diagnoses in each of the MTFs for which we had data for the last 6 months of both FY 1992 and FY 1994.

The results are shown in table 8. The data illustrate how many diagnoses in peacetime practice are exactly the same as those that were needed in a particular war in a particular place. As expected, the numbers are small for the diagnoses corresponding to battle injuries. The diagnoses corresponding to the five battle injuries represent less than one-tenth of a percent of the total diagnoses for all cases seen at the MTFs in table 8. It seems unlikely that these few cases could provide an experience base that would increase care readiness in

wartime. However, this sort of readiness indicator could be expanded to include other diagnostic codes observed in peacetime, which military physicians felt could be used as surrogates for those expected under various wartime scenarios.

Table 7. Most frequently occurring battle injury patient conditions in Vietnam database

Rank	Code	Condition
1	PC 97	Open wound chest/back w/complications
2	PC 138	Open wound knee/leg/ankle w/complications
3	PC 65	Open wound shoulder w/complications except tendons
4	PC 129	Open wound hip/thigh w/complications
5	PC 48	Wound face/jaw/neck

Table 8. Frequency of diagnoses by site for last 6 months of FY 1992 and FY 1994 for five most frequently occurring battle injury patient conditions in NHRC Vietnam database

Region	PC code	1992	1994	Percentage change
VA	PC 48	20	11	
	PC 65	0	0	
	PC 97	1	2	
	PC 129	0	0	
	<u>PC 138</u>	<u>1</u>	<u>5</u>	
	(All)	22	18	-18.2
CA	PC 48	19	29	
	PC 65	1	0	
	PC 97	0	1	
	PC 129	1	2	
	<u>PC 138</u>	<u>5</u>	<u>11</u>	
	(All)	26	43	65.4
NC	PC 48	5	4	
	PC 65	1	1	
	PC 97	1	0	
	PC 129	1	4	
	<u>PC 138</u>	<u>2</u>	<u>2</u>	
	(All)	10	11	10.0

Training time

The readiness of medical personnel may be affected by Tricare if military medical personnel have less time available for training. The guarantee of providing Prime members care may increase the tension between maintaining readiness and peacetime care. Our survey of physicians in 1992 and 1995 gives us information on the number of self-reported hours spent on readiness activities [8]. Tables 9 and 10 show these results. Our survey contains no evidence that the implementation of Tricare has had an impact on training time. Training hours for physicians in the Tricare region has remained about the same in 1992 and 1994, while time spent on readiness-related training has decreased elsewhere.

Table 9. Physicians' self-reported hours spent per week on readiness

Hours/week on readiness	Number of physicians reporting by region		
	VA	CA	NC
1992			
Under 2	200	329	42
2 to 8	64	105	14
Over 8	7	7	0
All	271	441	56
1995			
Under 2	209	259	32
2 to 8	70	153	29
Over 8	4	5	1
All	283	417	62

Table 10. Percentage change (1992–1994) in hours per week that military physicians worked on readiness

Hours/week on readiness	Percentage change by region		
	VA	CA	NC
Under 2	-0.4	13.8	23.4
2 to 8	-1.1	-14.0	-21.8
Over 8	1.5	0.1	-1.6

Summary

In summary, we began this work by developing a medical readiness framework as a backdrop for relating Tricare and readiness. We suggested quantifiable, but indirect, measures that could be easily tracked, or developed from existing data. We then described results from data available, which show little evidence of changes in readiness due to Tricare. This was ascribed to the infancy of the Tricare program. Conclusions regarding the effect of Tricare on medical readiness are inappropriate at this point in time.

We have summarized answers to two questions:

- What are the important readiness objectives from each perspective?
- What indicators might measure performance toward these objectives?

The answers to these questions may be useful in answering the most relevant overarching question that remains: How can we improve medical readiness in the future under the Tricare system?

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